

Abstract Submitted
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High-energy heavy ion and proton irradiation of iron-pnictide superconductors¹ W.K. KWOK, J. HUA, A.E. KOSHELEV, V.K. VLASKO-VLASOV, J. SCHLUETER, H. CLAUS, U. WELP, Materials Science Division, Argonne National Laboratory, H.Q. LUO, Z.S. WANG, G. MU, H.H. WEN, Institute of Physics, Chinese Academy of Sciences, A. KAYANI, Western Michigan University, R. PROZOROV, M.A. TANATAR, N. NI, S.L. BUD'KO, P. CANFIELD, Ames Laboratory and Iowa State University — We report on magnetization measurements on $\text{Ba}_{0.6}\text{K}_{0.4}\text{Fe}_2\text{As}_2$ single crystals irradiated with 6 MeV protons followed by 1.4 GeV Pb ions to a dose matching field of 2.0 Tesla. We see a systematic increase of the critical current at all temperatures and fields with J_c increasing nearly a factor of ten at 20 K. In addition, we report on magnetization measurements on $\text{Ba}_{0.6}\text{K}_{0.4}\text{Fe}_2\text{As}_2$ single crystals irradiated with 1.4 GeV Pb ions to dose matching fields of 0.1T and 1.0T. Here, we see a systematic increase of both the irreversibility line and the critical current with increasing irradiation dose. Our results show that both proton and heavy ions are good candidates for increasing vortex pinning in these materials.

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